NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fort St. Vrain, Unit No. 1	0 5 0 0 0 2 6 7	1 OF 0 5

TITLE (4) "C" Circulator Trip on Buffer-Mid-Buffer

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
									N/A	0 5 0 0 0
0 1	0 5	8 6	8 6	0 0 2	0 0	0 2	0 2	8 6		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	XX 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Jim Eggebroten, Superintendent, Technical Services Eng.	AREA CODE 3 0 3 7 8 5 - 2 2 2 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	XX NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

ABSTRACT:

At 0048 hours on January 3, 1986, with the reactor shutdown and "A" and "D" circulators operating via condensate drive, "C" circulator tripped on low buffer-mid-buffer differential pressure (ΔP) during Environmental Qualification post-maintenance testing on "C" circulator's brake and seal. "C" circulator's main drain manual isolation valve (V-211126) was found closed, thereby stopping bearing water flow through the main drain of "C" circulator. This caused bearing water to flow up the circulator shaft, resulting in a low buffer-mid-buffer ΔP circulator trip on "C" circulator. The Reactor Side Equipment Operator opened the valve, after which brake and seal testing continued on "C" circulator. The circulator was brought to self-turbining status at 1810 hours on January 3, 1986.

Single circulator trip actuation is considered to be that portion of the Plant Protective System (PPS) which is oriented toward protecting various plant components from major damage. It is not considered to be a part of the Reactor Protection System (RPS) and is therefore not considered to require notification or reporting in accordance with the requirements of 10 CFR 50.72 and 50.73. However, due to concerns expressed by the Senior Resident Inspector, the Licensee will voluntarily report single circulator trip actuations until this matter is fully resolved.

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BACKGROUND:

Bearing water is supplied to each circulator at a rate of about 170 gpm. Water leaves the circulator bearings via the helium/water drain, the main drain, and the steam/water drain. The main drain handles the bulk of the bearing water, collecting approximately 165 gpm of the 170 gpm total supplied.

The helium and water mixture (about 100 lb/hr of helium, 1 gpm of water) leaving the helium/water drain flows to the high pressure separator. Bearing water from the hign pressure separator and the main drain is returned by gravity flow, via separate lines, to the corresponding loop surge tank. Thus, approximately 166 gpm of the 170 gpm supplied to each circulator is recycled to the surge tank. The remainder of the bearing water (about 4 gpm) flows through the steam/water drain to the low pressure separator.

EVENT DESCRIPTION:

At 0048 hours on January 3, 1986, with the reactor shutdown and "A" and "D" circulators operating via condensate drive, "C" circulator tripped on low buffer-mid-buffer differential pressure (ΔP). This circulator trip occurred during Environmental Qualification post-maintenance testing on "C" circulator's brake and seal.

The main drain manual isolation valve (V-211126) was found closed, thereby stopping bearing water flow through "C" circulator's main drain (see Figure 1). The Control Room Operator instructed the Reactor Side Equipment Operator to open the valve, after which brake and seal testing continued on "C" circulator. The circulator was placed in the self-turbining mode of operation at 1810 hours on January 3, 1986.

ANALYSIS OF EVENT:

Following the circulator trip, the Reactor Side Equipment Operator found "C" circulator's main drain manual isolation valve (V-211126) closed with no clearance tags hung on the valve. Therefore, bearing water from the main drain could not be returned to the Loop 2 surge tank (T-2105) (see Figure 1). Thus, bearing water (which would normally flow through the main drain) flowed up the circulator shaft, resulting in low buffer-mid-buffer ΔP on "C" circulator and a subsequent circulator trip.

A clearance was removed from "C" circulator's brake and seal on December 30, 1985 (Clearance #14670). An auxiliary clearance card to Clearance #14670 was also removed from V-211126 at this time. The Standard Clearance Points (SCP) form attached to the clearance confirms that the valve was returned to its normal position (open), and that this was independently verified in accordance with procedure. Hence, the valve was apparently closed sometime between December 30, 1985 and January 3, 1986. No other clearances in existence at the time of the event required V-211126 to be closed. Therefore, it is assumed that the valve was erroneously repositioned during the time frame from December 30, 1985 to January 3, 1986.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

This single circulator trip actuation provided the appropriate plant equipment protective function, as designed. There were no safety implications to the plant or public as a result of this event.

Other circulator trip events were reported in LER #85-014, 85-015, 85-016, 85-022, 85-023, 85-026, and 85-030.

CAUSE DESCRIPTION:

The root cause of this circulator trip was a personnel error. "C" circulator's main drain manual isolation valve (V-211126), a normally open valve, was found closed. This stopped the flow of bearing water through "C" circulator's main drain, resulting in a low buffer-mid-buffer ΔP circulator trip. It is assumed that V-211126 was erroneously repositioned during the time frame from December 30, 1985 to January 3, 1986.

CORRECTIVE ACTION:

The main drain manual isolation valve, V-211126, was opened by the Reactor Side Equipment Operator. Brake and seal testing was completed, and "C" circulator was brought to self-turbining status at 1810 hours on January 3, 1986.

This LER will be routed through the plant's Operating Information Assessment Group (OIAG), which will remind all plant personnel to use caution when manipulating valve positions, and ensure that the correct valve is being operated.

No further corrective action is anticipated or required.

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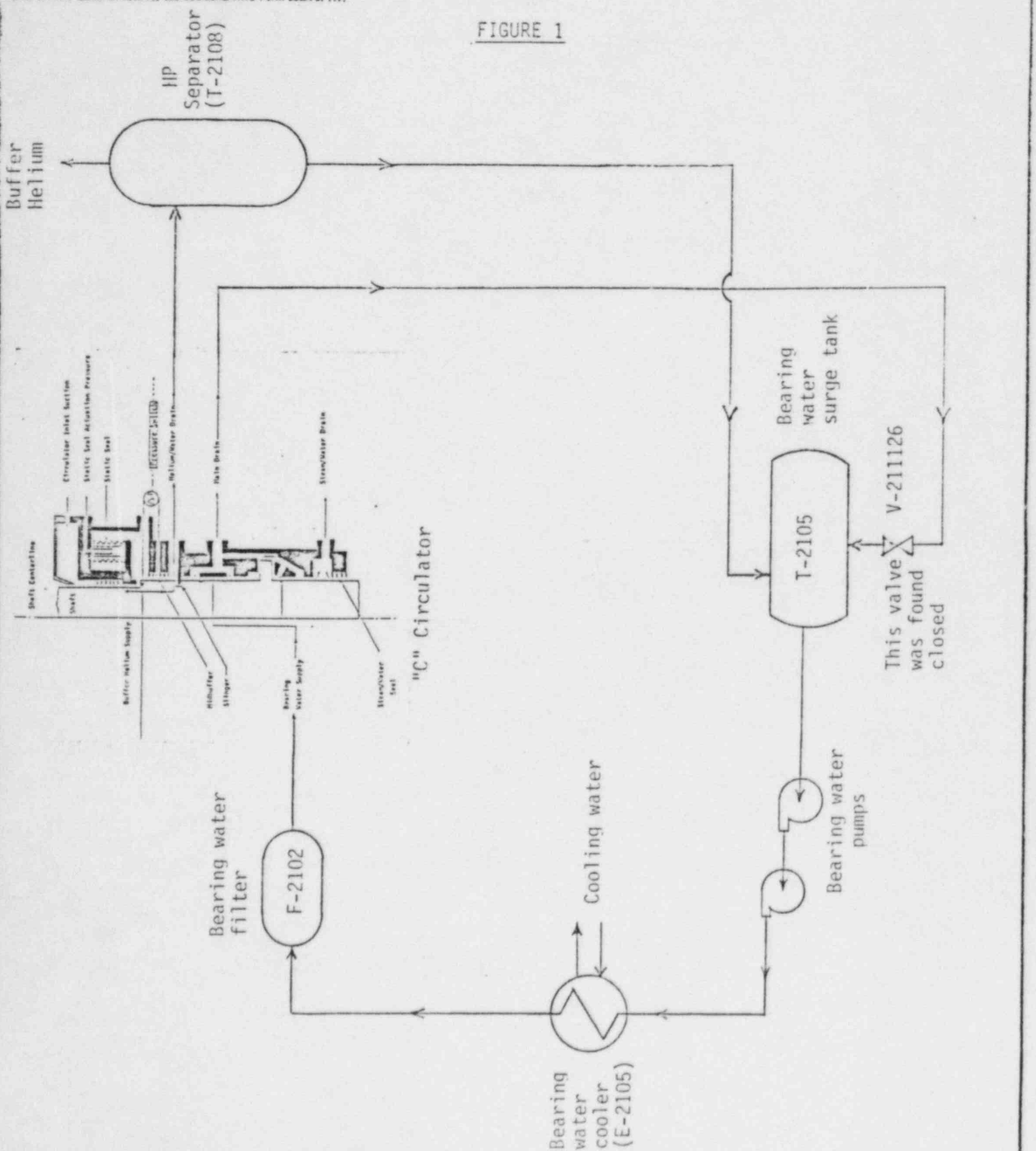
TEXT (If more space is required, use additional NRC Form 366A's) (17)

FIGURE 1



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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Jeff S. Castor
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Technical Services Senior Technician

Jim Eggebroten
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Superintendent, Technical Services Eng.

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February 2, 1986
Fort St. Vrain
Unit No. 1
P-86070

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket No. 50-267

SUBJECT: Licensee Event Report
86-001, Final Report

REFERENCE: Facility Operating
License No. DPR-34

Gentlemen:

Enclosed please find a copy of Licensee Event Report No. 50-267/86-001, Final, submitted per the requirements of 10 CFR 50.73(a)(2)(iv).

Sincerely,

J. W. Gahm
Manager, Nuclear Production

Enclosure

cc: Regional Administrator, Region IV
Attn.: Mr. E. H. Johnson, Chief
Reactor Projects Branch

cc: Director of Nuclear Reactor Regulation
Attn.: Mr. H. N. Berkow, Project Director
Standardization and Special
Projects Directorate

cc: Director, MIPC

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